

REMARKS

Applicants thank the Office for withdrawing the rejection of the claims as obvious over Sawahata (U.S. 6,294,639) as set forth in the Office Action of February 8, 2008.

The Office now asserts that Claims 1 and 4-5 are anticipated by a patent to Kawada (U.S. 5,158,619). Applicants submit that Kawada does not disclose the liquid crystal aligning agent of the present claims.

Independent Claim 1 is drawn to a liquid crystal aligning agent that comprises (i) a polyimide precursor and (ii) a second polyimide precursor or a polyimide. The liquid crystal aligning agent is described on page 6, lines 2-14 of the specification:

The liquid crystal aligning agent of the present invention is a composition to be used for formation of a liquid crystal alignment film, and is characterized by comprising a polyimide precursor (hereinafter referred to as a specific polymer a) as a low resistance component having a structural unit represented by the formula (1) and having a volume resistivity of from  $1 \times 10^{10}$  to  $1 \times 10^{14}$   $\Omega$  cm and a polyimide precursor as a high alignment component having a structural unit represented by the formula (2-1) or a polyimide as a high alignment component having a structural unit represented by the formula (2-2) (hereinafter referred to as a specific polymer b).

The liquid crystal aligning agent of the present claims includes a polymer "a" and a polymer "b".

The Office asserts that Kawada's disclosure of a "polyimide obtained by cyclodehydration of a polyamic acid (dehydrating to cause ring closure...)" anticipates the presently claimed invention. Applicants submit that this is not correct. Kawada does not disclose a composition that contains materials corresponding to both polymer "a" and polymer "b" discussed above and recited in the present claims. Because Kawada does not disclose a composition falling within the present claims, Kawada cannot anticipate the presently claimed invention. Applicants respectfully request withdrawal of the rejection.

The Office stated that the limitations of present Claim 1 are met by Kawada's disclosure that a diaminocarbazole derivative "can constitute 100% of total diamine". Applicants submit that the Office mischaracterizes the presently claimed invention. Although group A in the polyimide precursor identified by formula (1) (i.e., polymer "a") may contain 100 mol% of the carbazole identified by formula (7) of Claim 1, Claim 1 includes the polyimide precursor of formula (2-1) or the polyimide of formula (2-2) which contain groups "B" of which at least 10 mol% must be a bivalent organic group having any one of the structures (3) to (5), or a paraphenylene group, as recited in present Claim 1. The group "B" of formula (2-1) and (2-2) is not a diaminocarbazole. The diaminocarbazole which the Office asserts may constitute 100% of the total diamine cannot be present in an amount of 100% because at least 10 mol% of the groups B must be a bivalent organic group having any one of the structures (3) to (5), or a paraphenylene group, as recited in present Claim 1.

The Office's basis for rejecting the claims is therefore not correct and the rejection should be withdrawn.

In the alternate, the Office rejects the claims as obvious over the combination of Sawahata and Kawada. In particular the Office asserts that one of ordinary skill in the art would use the carbazole-diamine of Kawada in the polyimide of Sawahata for the reason that Kawada discloses that high heat stability is obtained with the inclusion of a carbazole-diamine unit.

Applicants submit that the Office's assertion in this regard is not correct. Kawada does not disclose that improved heat stability is obtained when a carbazole-diamine is included in the structure of the Kawada polyimide. For reference the disclosure of Kawada relied on by the Office is repeated below:

As described above, the polyimides containing an imide linkage in the repeating unit are superior in environmental resistance such as heat resistance, solvent resistance, and the like. The stability is ascribable to the skeletal structure of the

polyimide which restricts the degree of freedom of the molecular chain movement to raise the melting point, thereby giving high heat resistance. Since carbazole is a fused ring type hydrocarbon, its structure is planar, so that the degree of freedom of movement of the molecules of the polyimide is not increased by introduction of the carbazole ring, and is kept at the same level as ordinary polyimides. Therefore the introduction of carbazole rings into the main chain of the polyimide does not impair the heat resistance of the polyimide. Additionally, the introduction of a carbazole ring does not impair the superior environmental stability of common polyimides, such as solvent resistance. The polyimide containing the carbazole skeleton exhibits characteristics of both a polyimide compound and a carbazole skeleton.

See column 4, lines 39-59 of Kawada.

Contrary to the Office's assertion, the above-quoted text of Kawada does not disclose that the inclusion of a carbazole monomer unit provides high heat stability. In fact, Kawada discloses that the inclusion of carbazole rings "does not impair the heat resistance of the polyimide" (column 4, lines 53-54 of Kawada). Kawada's disclosure that carbazoles do not impair performance is not a teaching to encourage those of ordinary skill in the art to include carbazole rings in other polyimides. The Kawada text cited by the Office, at best, discloses that carbazole-containing polyimides have the same heat resistance as conventional polyimides but does not disclose or suggest that the inclusion of a carbazole will lead to improved heat stability.

The Office's basis for asserting that one of ordinary skill in the art would be motivated to use the carbazole monomer unit of Kawada in the polyamic acid and/or polyimide of Sawahata is therefore not correct and the rejection should be withdrawn.

As a further reason for asserting that the present claims are obvious over Sawahata the Office asserts that Sawahata teaches that two different types of polyamic acids may be used in the Sawahata liquid crystal aligning agent (see the second full paragraph on page 5 of the July 30<sup>th</sup> Office Action). Applicants submit that the Office's characterization of Example 10 of Sawahata is not correct. Contrary to the Office's assertion Example 10 does not disclose a

composition containing two different types of polyamic acids. Instead, Example 10 discloses a composition that includes a polyamic acid (identified as composition A-1) and a polyimide (S-1). Thus, Example 10 does not disclose a mixture of polyamic acids but instead discloses a mixture that contains a polyamic acid component and a polyimide component. The Office's assertion to the contrary is not correct.

Further with regard to Example 10 of Sawahata, Applicants submit that the cited example teaches away from the presently claimed invention. Example 10 describes a mixture of a first composition containing a polyamic acid (A-1) and a polyimide (S-1). The polyimide used in the polyamic acid/polyimide mixture of Example 10 is described in Example 7 of Sawahata. Example 7 includes a description of the voltage holding property (e.g., voltage retention) that is obtained using the polyimide of Example 7 in a liquid crystal cell (see column 13, line 33 of Sawahata which discloses voltage holding at 23°C and 90°C of 99% and 83%, respectively). When the polyimide of Example 7 is mixed with the polyamic acid (A-1) the resulting composition has decreased voltage holding property (i.e., 99% and 81% at 23°C and 90°C, respectively).

Applicants submit that Example 10 teaches those of ordinary skill in the art that using mixtures of two different materials such as a polyamic acid and a polyimide forms a liquid crystal cell having poor voltage holding properties. Applicants submit that this information would direct those of skill in the art away from the presently claimed invention which requires a mixture of two different types of polymers, i.e., polymer "a" and polymer "b" described above.

For the reasons explained above in detail Applicants submit that the rejections should be withdrawn and any now-pending, active claims allowed.

INFORMATION DISCLOSURE STATEMENT

The Amendment filed in the present case on July 8, 2008 included a request for the Office to return a signed and dated copy of an IDS submitted on August 3, 2007 (see page 9, second to the last full paragraph). The July 31, 2008 Office Action did not resolve the issue presented in the Amendment of July 8, 2008.

Applicants submitted an IDS on August 3, 2007 including a PTO-1449 citing two foreign documents. Applicants request the Office to provide a signed and dated copy of the August 3, 2007 IDS acknowledging the Office's consideration of the references cited thereon.

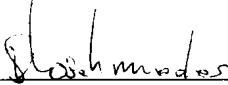
For the reasons stated above in detail, Applicants request withdraw of the rejections and the allowance of all now-pending claims.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.  
Norman F. Oblon

Customer Number  
**22850**

Tel: (703) 413-3000  
Fax: (703) 413 -2220  
(OSMMN 08/07)

  
\_\_\_\_\_  
Stefan U. Koschmieder, Ph.D.  
Registration No. 50,238